

their own waters. But no one ever saw an Irish fishing-boat in either a Scotch or English sea. The Englishmen and Scotchmen, with their capital continuously employed throughout the year, beat, of course, the Irishman who leaves it idle and unemployed for three-fourths of it.

The view which we have thus expressed is not, however, shared either by the friends of Ireland or the Irish Inspectors. In their eyes the decrease in the number of Irish fishermen is equivalent to the decay of the Irish fisheries; and both of these are due to the unsympathetic attitude of this country. Last year nothing would do any good but loans. Now that the Reproductive Loan Fund has been utilised for this purpose with effects which we shall immediately notice, nothing will do any good but a safe and commodious harbour at Arklow. Such a harbour "is most necessary for the successful prosecution of both herring and oyster fisheries," and "unless something be done, there is little hope of any substantial improvement." We have no desire to discourage the construction of safe and commodious harbours, but we should like to ask the Irish Inspectors whether they ever heard of a place in England called Yarmouth. It is as important a fishing station as Arklow, it is on as stormy a shore; but when a storm is raging, the Yarmouth fishermen have to stand out to sea to avoid being driven on to the coast. We never heard that the want of a harbour at Yarmouth had destroyed the Yarmouth fishery; and we think that Yarmouth has at least as good a claim as Arklow for the construction of such a harbour. The new system of loans to fishermen remains for consideration. There has, of course, been no want of applicants for the loans. 2,800 individuals have already applied for the money, and we have no doubt there are a good many more quite prepared to follow their example. 1,300 of the 2,800 applications emanate from County Galway, and 160 of these applicants live in one parish. No more than six of the 160 "fulfil the conditions which should entitle them to obtain a loan!" We presume that as the Inspectors pointedly refer to the 160 applicants, they may be regarded as fair examples of the 2,800 who have applied. In that case only 105 persons throughout Ireland will, in the lenient judgment of the promoters of the policy, be entitled to participate in the loan. Is it possible to conceive a more striking illustration of the consequences of the policy?

#### MAGNUS'S "ELEMENTARY MECHANICS"

*Lessons in Elementary Mechanics introductory to the Study of Physical Science, with numerous Exercises.*  
By Philip Magnus, B.Sc., B.A. (Longmans, 1875.)

IN order to assign any work to its proper place it is necessary that we should try to ascertain what is the author's aim in writing it, and also to see if that aim be to any fair extent attained; further, we should take into our account the consideration of the question whether if the author's end be attained it is one worth arriving at. If the verdict on all these issues be favourable, then we may say that the *raison d'être* of the work is justified. For the aim of the present volume the title will suggest at once that the author does not attempt to produce a treatise which shall enter into comparison with such works as those produced by Thomson and Tait. Let us hear his own statement: "The lessons are intended for

the use of those who have had no previous acquaintance with the subject;" and so he has endeavoured to bring into prominence the leading principles of Mechanics, and to exemplify them by simple illustrations. Here we may observe that the term mechanics is used in the ordinary acceptance of that word now-a-days, *i.e.*, as the science of the motion and equilibrium of bodies, and not in the Newtonian sense to which Messrs. Thomson and Tait seek again to restrict it. Starting on the hypothesis that the idea of Motion is more elementary than that of Force, since it is only from a combination of forces that equilibrium can result, the author makes the subject of Statics depend upon the laws of Dynamics. Hence the proposition, which is generally cited as that of the Parallelogram of Forces, Mr. Magnus derives at once from Newton's second Law.

After a short preliminary introduction we have "Kinematics—Motion" treated under the heads of Measurement of Motion and Falling Bodies; then "Dynamics—Force," under which heading we have Measurement of Force, the Laws of Motion, Energy, Machines.

The second part of the book discusses "Statics—Rest," under the following heads: Theory of Equilibrium, Centre of Gravity.

The style is lucid, the solved exercises carefully chosen, the work compact. With the exception above mentioned, of Statics being made dependent on Dynamics, the arrangement and matter are much the same as we find in English treatises. An intelligent boy ought in a few months to be able to make himself master of the greater portion of this small book, which Mr. Magnus has aimed at making sufficiently elementary to be placed in the hands of a beginner. What we consider to be higher praise is that we believe it to contain nothing that the student will have to unlearn in a subsequent portion of his career. We can recommend it as a trustworthy introduction to more advanced text-books.

We have endeavoured to test its accuracy as regards the answers to the numerous questions scattered over its pages. Of these there are 279 in the Dynamical portion, 192 in the Statical portion, besides 79 questions in an appendix composed of papers from the Matriculation, South Kensington, College of Preceptors, Oxford Local, Cambridge Local, and other Examinations. These answers seem to us to be exceptionally correct, as, though we have tried them all, we differ from Mr. Magnus's results in only a dozen cases; some of these cases are apparently clerical errors. We make this statement, taking into account two or three slips of errata which have been subsequently distributed by the author.

In Ex. 23, p. 86, 1368th should be 1368th, *i.e.*, 355; § 199, we think, would not be easy for the pupil unless he had some aid from a tutor. Some of the questions given to the Matriculation candidates of the University of London seem to us hardly suitable for them; we shall select one, because even so experienced a teacher as the writer of the work we have noticed at first fell into an error. The question is: "Suppose that at the equator a straight, hollow tube were thrust vertically down towards the centre of the earth, and that a heavy body were dropped through the centre of such a tube. It would soon strike one side; find which, giving a reason for your reply." The author gives an answer which we have heard

one or two "coaches" give also, but on a slip he has corrected his printed answer.

Again, in Ex. 27, p. 55: "A balloon has been ascending vertically at a uniform rate for 45 secs., and a stone let fall from it reaches the ground in 7 secs.; find the velocity of the balloon and the height from which the stone is let fall." Both Mr. Magnus and Dr. Wormell ("Natural Philosophy," p. 129, Ex. 45) work this question as if the balloon were at rest when the stone is let fall; we see no reason for their doing so in the wording of the question. They give the same height for the balloon, but differ in the velocity.

### OUR BOOK SHELF

*Game Preservers and Bird Preservers.* By Capt. J. F. Morant. (Longmans, Green, and Co., 1875.)

To increase the annual rental of Scotch moorland, and to feel certain that at least thirty brace of grouse will fall to each gun after a whole day's sport, are the greatest delights of a certain few, according to whom every other consideration must be put in abeyance. Capt. Morant is one of these. "The red grouse is about the best game bird in the whole world, and deserves all the care we can bestow upon him." This care involves the annihilation of every creature that shows the least disposition to destroy and feed upon the eggs, young, or adult of *Lagopus scoticus*; and the death-list is no small one, including eagles, buzzards, hen harriers, all other Raptores, ravens, crows, magpies, wild foxes, polecats, stoats, and weasels. The stomachs of hawks are often found to contain the remains of weasels and rats; why kill them if they destroy those vermin? "If an alderman were shipwrecked on an uninhabited island, he would probably live upon the contents of a cask of biscuits which might be washed ashore. But the scientific gentleman among a party of savages who might examine him after his friends who happened to land on that island had killed him for their supper, would, we know, arrive at an erroneous conclusion if he entered it in his note-book as a fact that the animal *alderman* lived entirely on dry biscuit." This running analogy is the argument employed throughout the book, and it is this which makes it a particularly amusing one to glance through; whether it carries conviction with it is a different thing. The grouse disease is explained as depending on the fact that these birds, unlike others, eat only one food, heather, and when this is injured by cold or otherwise, they have no other to fall back on. That many shot-damaged birds survive and afterwards produce unhealthy offspring is considered unlikely. "Can we fancy a grouse telling his mate on a spring morning, My dear, I feel very poorly to-day; that No. 5 in my spine is troubling me dreadfully?" The author's raid against all the Raptores is very severe; he in this, as in other points, being much opposed to the general tenour of the report of the evidence given before the Parliamentary Select Committee appointed in 1873. His considerable experience adds great weight to the aspect of the question which he espouses.

*The Handy-Book of Bees, being a Practical Treatise on their Profitable Management.* By A. Pettigrew. Second Edition, revised and improved. (Edinburgh and London: Blackwood and Sons, 1875.)

*A Manual of Bee-keeping.* By John Hunter, Honorary Secretary of the British Bee-keepers' Association. (London: Hardwicke, 1875.)

THESE two volumes have different objects and will serve different purposes. The first edition of Mr. Pettigrew's book was favourably noticed in our columns five years ago (NATURE, vol. ii. p. 82), and we are glad to see that a second edition has been called for. Still more pleased are we to find that the author is open to conviction, and

that he has acknowledged and corrected a few theoretical errors in the first edition. For the economical management of bees with a view to profit, there is no better guide than Mr. Pettigrew.

Mr. Hunter's volume, on the other hand, is essentially a book for the amateur, to whom profit is of less importance than the amusement and interest of bee-keeping. He gives an account of all the appliances of the modern apiarian, and of the most recent improvements in the treatment and study of bees. The various kinds of honey-extractors, feeders, guide-combs, and queen-cages; the methods of artificial swarming, queen-breeding, and ligurianising; the diseases and enemies of bees; and the various methods of preparing and preserving the honey and wax, are all briefly discussed. Some of the most recent observations on the habits and instincts of bees are given, including Sir John Lubbock's interesting proof that they distinguish colours. The book is illustrated with a number of useful woodcuts, chiefly of hives and apparatus; and it will be indispensable to amateurs who wish to acquaint themselves with the most recent improvements in the art of bee-keeping, and the latest discoveries as to the habits, instincts, and general natural history of the honey-bee.

A. R. W.

### LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

#### Personal Equation in the Tabulation of Thermograms, &c.

IN a late number of NATURE (vol. xii. p. 101) you have commented upon the work performed by the Meteorological Office. Although in no way interested in the defence of that department, I think objection may fairly be taken to the style of criticism adopted. Not only would it, in most cases, be necessary to refer to the original thermograms satisfactorily to detect the many small errors pointed out, but it is well known to practical men that owing to certain idiosyncrasies of individuals some of the numbers 1, 2, 3 . . . 8, 9, 0 do occur in estimations more often than others, and of course more often than they should do theoretically. In no case are such personal peculiarities likely to show themselves more than in the determination of the position of a hazy photographic trace of sensible breadth, as between two sharply defined lines. As an example of my meaning, I may refer to somewhat similar estimations of tenths of seconds, as tabulated by the highly-trained and experienced observers of Greenwich, only premising for the information of the uninitiated, that the tenth part of a second is far too large a measure of time to be trifled with by astronomers, and that practically the estimation is simply that of the position of one sharply marked puncture or dot as referred to two others equally well defined on either side of it, indicating the beginning and end of the second, and separated by about one-third of an inch. Referring to the Greenwich Observations of 1864 (the only volume I have at hand), and taking three days' observations at random for the experiment, I have determined the percentage of times that each of the numbers 1, 2, 3 . . . 8, 9, 0 occur as the tenth at which transits of stars took place. As there is no theoretical reason why one number should predominate over another, we may expect that the percentage for each figure will be accurately 10, or each a tenth of the entire number.

The following are the percentages founded upon 511 estimations on April 21, upon 379 on April 19, and upon 393 on Nov. 5, 1864, respectively:—

	1.	2.	3.	4.	5.	6.	7.	8.	9.	0.
Per- centages {	5.7	6.5	9.0	21.1	11.7	11.0	6.3	8.4	5.9	14.3
	6.9	9.2	10.0	13.7	10.8	12.4	7.4	8.7	5.3	15.6
	8.4	8.1	7.6	13.7	10.9	9.4	8.1	9.7	8.9	15.0
Mean of 3 days {	7.0	7.9	8.9	16.2	11.1	10.9	7.3	8.9	6.7	15.0